CLAIMS:

1. A multi-stack optical data storage medium (20) for rewritable recording using a focused radiation beam (19) entering through an entrance face (16) of the medium (20) during recording, comprising:

-a substrate (1) with deposited on a side thereof:

-a first recording stack (2) L_0 comprising a first phase-change type recording layer (6), said first recording stack (2) being present at a position most remote from the entrance face (16),

-at least one further recording stack (3) L_n , which comprises a further phase-change type recording layer (12), being present closer to the entrance face (16) than the first recording stack (2),

-a transparent spacer layer (9) between the recording stacks (2, 3), said transparent spacer (9) layer having a thickness larger than the depth of focus of the focused laser-light beam (19),

characterized in that the further recording layer (12) is substantially of an alloy defined by the formula $Ge_xSb_yTe_z$ in atomic percentages, where $0 < x < 15$, $50 < y < 80$, $10 < z < 30$ and $x + y + z = 100$ with a thickness selected from the range of 4 to 12 nm and that at least one transparent crystallization promoting layer (11', 13') having a thickness smaller than 5 nm is present in contact with the further recording layer (12).

2. An optical storage medium (20) as claimed in claim 1, wherein the transparent crystallization promoting layer (11', 13') mainly comprises a material selected from the group of nitrides, oxides of Si, Al and Hf.

3. An optical storage medium (20) as claimed in claim 2, wherein the transparent crystallization promoting layer (11', 13') mainly comprises a material selected from the group of nitrides of Al and nitrides of Si.

4. An optical storage medium (20) as claimed in claim 2, wherein the further recording layer (12) has a thickness selected from the range of 4 to 8 nm.

5. An optical storage medium (20) as claimed claim 1, wherein the alloy has a composition defined by the formula $Ge_xSb_yTe_z$ in atomic percentages, where $5 < x < 8$, $70 < y < 80$, $15 < z < 20$ and $x + y + z = 100$.

6. An optical storage medium (20) as claimed in any one of claims 1, wherein a metal reflective layer (14), semi-transparent for the radiation beam (19), is present in the further recording stack (3).

7. An optical storage medium (20) as claimed in claims 6, wherein the metal reflective layer (14) mainly comprises the element Cu.

8. Use of an optical storage medium (20) as claimed in any one of the preceding claims, for high speed recording with a recording speed higher than 12 m/s.